LISTING OF CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A process for producing a marking on a substrate,

wherein energy in the form of radiation is introduced from a controllable energy source into surface structurings of a replication surface of a replication apparatus to produce at least one shaping region,

wherein the shaping region of the replication surface is shaped on to the substrate by the replication apparatus contacting the substrate under pressure,

wherein the replication surface is subjected to a temperature control effect at least in a partial region using an additional controllable energy source,

wherein an energy input by radiation from the radiation producing energy source and an energy input from the additional controllable energy source is introduced into the replication surface so that at least one portion of the replication surface is in the form of a heat combination region,

wherein at least two portions of the replication surface are set to different temperatures, ~~and~~

wherein the marking is formed by shaping the shaping region on the substrate, wherein the portion of the replication surface which is in the form of the heat combination region directly and/or indirectly forms the shaping region, and

wherein, for the moment in time of the shaping operation, the temperature of the replication surface is set such that:

the temperature of the replication surface outside the heat combination region is set to a temperature or a temperature range in the plastic temperature range of the substrate and the temperature of the replication surface within the heat combination region is set to a temperature or a temperature range in the flow temperature range of the substrate; or

the temperature of the replication surface outside the heat combination region is set to a temperature or a temperature range in the elastic temperature range of the substrate and the temperature of the replication surface within the heat combination region is set to a temperature or a temperature range in the plastic temperature range of the substrate.

2. (Canceled)

3. (Canceled)

4. (Previously Presented) A process as set forth in claim 1, wherein the radiation introduced to produce the at least one shaping region is fed through the substrate.

5. (Previously Presented) A process as set forth in claim 1, wherein a rotating replication roller having the replication surface on its outside is used as the replication apparatus and the radiation is introduced into the replication surface of the replication roller before and/or while the heat combination region resulting therefrom comes into contact with the substrate for the shaping operation.

6. (Previously Presented) A process as set forth in claim 5, wherein a counterpressure apparatus co-operating with the replication roller is used, and the radiation for producing the at least one shaping region is supplied through the counterpressure apparatus or parts of the counterpressure apparatus into the replication surface of the replication roller.

7. (Previously Presented) A process as set forth in claim 5, wherein introduction of the radiation into the replication surface of the replication roller is effected at a first angular position of the replication roller and the shaping operation by contact of the replication surface of the replication roller with the substrate is effected at a second angular position of the replication roller, wherein, in the direction of rotation of the replication roller, an intermediate angle of less than 30° is set between the first angular position and the second angular position.

8. (Previously Presented) A process as set forth in claim 1, wherein the radiation acts over an area and/or in point form sequentially on the replication surface.

9. (Previously Presented) A process as set forth in claim 1, wherein the position of the impingement point of the radiation on the replication surface is controllable by a one-dimensional or multi-dimensional movement of the radiation and/or the power density in relation to surface area of the radiation at the impingement point of the radiation on the replication surface is controllable.

10. (Previously Presented) A process as set forth in claim 5, wherein a control sequence for actuation of the radiation-producing device extends over more than one revolution of the replication roller.

11. (Currently Amended) Apparatus for producing a marking on a substrate comprising:

a replication apparatus which is in the form of a replication roller, wherein a replication surface having surface structurings is provided on an outside of the replication roller,

a controllable energy source for producing a radiation wherein the radiation for producing at least one shaping region is directed on to at least one portion of the replication surface, and

a counterpressure apparatus which has a counterpressure surface, wherein the substrate is arrangeable between the replication surface of the replication apparatus and the counterpressure surface of the counterpressure apparatus in order to shape the shaping region on to the substrate in a contact region between the replication surface and the substrate,

wherein there is provided an additional controllable energy source in the form of a heating apparatus for temperature control of the replication surface,

wherein at least two portions of the replication surface are settable to different temperatures by an energy input of radiation from the energy source and an energy input from the heating apparatus into the replication surface so that at least one portion of the replication surface is in the form of a heat combination region,

wherein the marking is formable by shaping the shaping region on the substrate, ~~and~~

wherein the portion of the replication surface which is in the form of the heat combination region directly and/or indirectly forms the shaping region, and

wherein, for the moment in time of a shaping operation, the replication surface has an operable temperature range such that:

the temperature of the replication surface outside the heat combination region is set to a temperature or a temperature range in the plastic temperature range of the substrate and the temperature of the replication surface within the heat combination region is set to a temperature or a temperature range in the flow temperature range of the substrate; or

the temperature of the replication surface outside the heat combination region is set to a temperature or a temperature range in the elastic temperature range of the substrate and the temperature of the replication surface within the heat combination region is set to a temperature or a temperature range in the plastic temperature range of the substrate

12. (Previously Presented) Apparatus as set forth in claim 11, wherein the position in which the radiation acts on the portion of the replication surface during the irradiation operation and the position of the contact region between the replication surface and the substrate are arranged in overlapping relationship and/or in the direction of rotation of the replication roller with a spacing angle of a magnitude of less than 30°.

13. (Previously Presented) Apparatus as set forth in claim 11, wherein the radiation for producing the at least one shaping region is fed through the counterpressure apparatus or parts of the counterpressure apparatus.

14. (Previously Presented) Apparatus as set forth in claim 11, wherein the counterpressure apparatus, in the region of the counterpressure surface, is transparent for the radiation.

15. (Previously Presented) Apparatus as set forth in claim 11, wherein the counterpressure apparatus is in the form of a counterpressure roller.

16. (Previously Presented) Apparatus as set forth in claim 11, wherein the counterpressure apparatus is completely or portion-wise in the form of a hollow body.

17. (Previously Presented) Apparatus as set forth in claim 11, wherein the device for producing the radiation and/or a beam deflection unit is arranged within the counterpressure apparatus or within the replication roller.

18. (Previously Presented) Apparatus as set forth in claim 11, wherein the radiation for producing the shaping regions is fed through the substrate.

19. (Previously Presented) Apparatus as set forth in claim 11, wherein there is provided an apparatus for temperature control of the replication surface, namely a cooling apparatus for cooling the replication surface.

20. (Previously Presented) Apparatus as set forth in claim 11, wherein the heating apparatus is provided for heating the replication surface.

21. (Previously Presented) Apparatus as set forth in claim 11, wherein a marking comprising surface structurings which act diffractively or holographically is producible by the surface structurings of the replication surface.

22. (Previously Presented) Apparatus as set forth in claim 11, wherein a marking comprising a matt structure which scatters diffusely or directedly is producible by the surface structurings of the replication surface.

23. (Previously Presented) Apparatus as set forth in claim 11, wherein a marking comprising surface structurings which act diffractively or holographically is produced by the surface structurings of the replication surface.

24. (Previously Presented) Apparatus as set forth in claim 11, wherein a marking comprising a matt structure which scatters diffusely or directedly is produced by the surface structurings of the replication surface.

25. (Previously Presented) A process as set forth in Claim 1, wherein the substrate is a transfer film.

26. (Previously Presented) A process as set forth in Claim 1, wherein the energy introduced into the surface structurings of the replication surface is laser radiation energy.

27. (Previously Presented) Apparatus as set forth in Claim 11, wherein the substrate is a transfer film.

28. (Previously Presented) Apparatus as set forth in Claim 11, wherein the controllable energy source is a laser installation.

29. (Previously Presented) Apparatus as set forth in Claim 16, wherein the hollow body is a hollow glass cylinder having a cylinder wall which is transparent for the radiation.

30. (New) Apparatus for producing a marking on a substrate comprising:

a replication apparatus which is in the form of a replication roller, wherein a replication surface having surface structurings is provided on an outside of the replication roller,

a controllable energy source for producing a radiation wherein the radiation for producing at least one shaping region is directed on to at least one portion of the replication surface, and

a counterpressure apparatus which has a counterpressure surface, wherein the substrate is arrangeable between the replication surface of the replication apparatus and the counterpressure surface of the counterpressure apparatus in order to shape the shaping region on to the substrate in a contact region between the replication surface and the substrate,

wherein there is provided an additional controllable energy source in the form of a heating apparatus for temperature control of the replication surface,

wherein at least two portions of the replication surface are settable to different temperatures by an energy input of radiation from the energy source and an energy input from the heating apparatus into the replication surface so that at least one portion of the replication surface is in the form of a heat combination region,

wherein the marking is formable by shaping the shaping region on the substrate,

wherein the portion of the replication surface which is in the form of the heat combination region directly and/or indirectly forms the shaping region, and

wherein the radiation for producing the at least one shaping region is fed through the counterpressure apparatus or parts of the counterpressure apparatus.

31. (New) Apparatus for producing a marking on a substrate comprising:

a replication apparatus which is in the form of a replication roller, wherein a replication surface having surface structurings is provided on an outside of the replication roller,

a controllable energy source for producing a radiation wherein the radiation for producing at least one shaping region is directed on to at least one portion of the replication surface, and

a counterpressure apparatus which has a counterpressure surface, wherein the substrate is arrangeable between the replication surface of the replication apparatus and the counterpressure surface of the counterpressure apparatus in order to shape the shaping region on to the substrate in a contact region between the replication surface and the substrate,

wherein there is provided an additional controllable energy source in the form of a heating apparatus for temperature control of the replication surface,

wherein at least two portions of the replication surface are settable to different temperatures by an energy input of radiation from the energy source and an energy input from the heating apparatus into the replication surface so that at least one portion of the replication surface is in the form of a heat combination region,

wherein the marking is formable by shaping the shaping region on the substrate,

wherein the portion of the replication surface which is in the form of the heat combination region directly and/or indirectly forms the shaping region, and

wherein the counterpressure apparatus, in the region of the counterpressure surface, is transparent for the radiation.

32. (New) Apparatus for producing a marking on a substrate comprising:

a replication apparatus which is in the form of a replication roller, wherein a replication surface having surface structurings is provided on an outside of the replication roller,

a controllable energy source for producing a radiation wherein the radiation for producing at least one shaping region is directed on to at least one portion of the replication surface, and

a counterpressure apparatus which has a counterpressure surface, wherein the substrate is arrangeable between the replication surface of the replication apparatus and the counterpressure surface of the counterpressure apparatus in order to shape the shaping region on to the substrate in a contact region between the replication surface and the substrate,

wherein there is provided an additional controllable energy source in the form of a heating apparatus for temperature control of the replication surface,

wherein at least two portions of the replication surface are settable to different temperatures by an energy input of radiation from the energy source and an energy input from the heating apparatus into the replication surface so that at least one portion of the replication surface is in the form of a heat combination region,

wherein the marking is formable by shaping the shaping region on the substrate,

wherein the portion of the replication surface which is in the form of the heat combination region directly and/or indirectly forms the shaping region, and

wherein the counterpressure apparatus is completely or portion-wise in the form of a hollow body.